UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/623,946	11/03/2000	Josef Laumen	1324	2110

7590	04/19/2005

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EXAMINER
CHAUDRY, MUJTABA M

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	09/623,946	LAUMEN ET AL.
Office Action Summary	Examiner	Art Unit	
	Mujtaba K. Chaudry	2133	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 February 2005</u>.

2a)☐ This action is **FINAL**.　　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-8 and 10-12</u> is/are pending in the application.

　　4a) Of the above claim(s) <u>9</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-8 and 10-12</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's arguments/amendments with respect to amended claim 1 and previously presented

claims 2-8 and 10-12 filed February 07, 2005 have been fully considered but are not persuasive.

Applicant contends, "…Gordon (prior art of record) does not mention the fire code in the

context of variable redundancy…" The Examiner respectfully disagrees. Gordon teaches an

arrayed disk drive system for providing memory to a computer, said arrayed system having a

plurality of disk drives configured to form an array, said **arrayed disk drives accessed by a**

plurality of channels, each channel accessing a plurality of disk drives, including a means for

controlling the logical configuration of the arrayed disk drives to appear to the computer as any

conceivable arrangement of disk drives, whereby the arrayed disk drive may appear to the

computer as the plurality of disk drives, or as one large disk drive comprised of all the arrayed

disk drives, or any combination in between. A means for **providing a plurality of levels of**

redundancy on data read or written by the computer to the arrayed disk drives is provided,

as well as means controlled by the controlling means for enabling from none to the plurality of

levels of redundancy to operate on data being read or written from the arrayed disk drives.

Furthermore, Gordon teaches (col. 16) the HISR process block 72 is the host computer 32

interrupt service routine process. The HISR process 72 does all the handshaking with the host.

The HISR send input/output parameter blocks (IOPB) 74 from the host to the HTASK along

with some control signals. The HTASK process block 76 is the primary process block. It

handles all input/output (write/read) requests from the host 32. It is also responsible for: (1)

implementing variable redundancy schemes, (2) striping blocks of data in 512, 1024, etc.

block distributions, (3) mapping logical disk memory to the physical disk drives 14, (4)

performing the redundancy operation, queuing excess IOPBs, (5) accessing spare disk drives 15,

and (6) allocating microprocessor memory 42 to resemble a physical sector when that physical

sector is removed or defective. The Examiner would like to point out the variable redundancy

aspect of fire codes is inherently included within the equation since C is a variable and can be

freely set.

The Examiner disagrees with the Applicant and maintains rejections with respect to amended

claim 1 and previously presented claims 2-8 and 10-12. All arguments have been considered. It

is the Examiner's conclusion that amended claim 1 and previously presented claims 2-8 and 10-

12 are not patentably distinct or non-obvious over the prior art of record. See prior office action:

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966),

that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephen B.

Wicker (**Error Control Systems** – ISBN 0132008092) further in view of Gordon et al. (USPN

5148432).

As per claims 1, 3, 6-7 and 10-12, Wicker teaches (text: pages 437-440) encoding and

decoding data using Fire codes. Wicker teaches (p. 437, paragraphs 2-3) Fire codes that are

capable of correcting a single burst in a variable-length code word as stated in the present

application. Wicker teaches (p. 438) coding data with a fire code of generator polynomial, $G(x) =$

$(x^{(2b-1)} + 1)$ $*g(x)$ where $g(x)$ is a irreducible polynomial of degree m and the value of b may be

free set within predetermined limits as stated in the present application. Applicant uses the

polynomial $G(x) = (x^{(c)} + 1)$ $*P(x)$ and states in the specification (p. 7 of application) that $c = 2b$

-1.

Wicker does not explicitly teach the variable "c" in the irreducible polynomial to be

changeable so that the variable redundancy can be obtained as stated in the present application.

However, Gordon et al. (herein after Gordon), in an analogous art teaches (title and

abstract) an arrayed disk drive system for providing memory to a computer, wherein the arrayed

system has a plurality of disk drives configured to form an array. The arrayed disk drives are

accessed by a plurality of channels, each channel accessing a plurality of disk drives, including a

means for controlling the logical configuration of the arrayed disk drives to appear to the

computer as any conceivable arrangement of disk drives, whereby the arrayed disk drive may

appear to the computer as the plurality of disk drives, or as one large disk drive comprised of all

the arrayed disk drives, or any combination in between. Particularly, Gordon teaches a means for

providing a plurality of levels of redundancy on data read or written by the computer to the

arrayed disk drives is provided, as well as means controlled by the controlling means for

enabling from none to the plurality of levels of redundancy to operate on data being read or

written from the arrayed disk drives. Gordon teaches (col. 7, lines 55-65) the parity or error

detection and correction scheme used by the embedded SCSI controller is referred to as Fire

code. Fire code is a mathematical code for detecting and correcting short bursts of errors within a

very long field. The fire code generator, a microprocessor and a microprocessor memory are all

located within the disk drive 14 itself. Furthermore, Gordon teaches (col. 16-17) to implement

variable redundant schemes.

Therefore it would have been obvious to one of ordinary skill in the art at the time the

invention was made to incorporated adaptability for Fire Codes of Gordon within the teachings

of Wicker to form the present method and apparatus. This modification would have been obvious

to one of ordinary skill in the art at the time the invention was made because one of ordinary skill

in the art would have recognized that by varying the value of "C" in the irreducible polynomial

of the fire code would have enhanced the error detecting/correcting capability since the system

would be adaptive.

As per claims 2, 4 and 5, Wicker teaches (p. 438-439) the technique to calculate the value

for $2b-1$, which is equivalent to c in the present application. Wicker also teaches (p. 437) a disk

register whose length can be set to b, wherein b can be less than m as stated in the present

application.

As per claim 8, Wicker teaches (p. 440) the Fire decoding operation in which the

redundancy properties are incorporated as stated in the present application. In particular, steps 3

and 4 (p. 440) Wicker states if one syndrome is nonzero and the other is zero, then the

codeword contains a uncorrectable but detectable error, which is analogous to d in the present

application. The equation $(d = c + 1 - b)$ in the present application which may be is interpreted

as $c = (b + d) - 1$ wherein the term $b + d$ represents the bundle error and the detectable error and

is incorporated in steps 3 and 4 of Wicker.

Conclusion

Any inquiries concerning this communication should be directed to the examiner,

Mujtaba Chaudry who may be reached at 571-272-3817. The examiner may normally be reached

Mon – Thur 6:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, please contact the

examiner's supervisor, Albert DeCady at 571-272-3819.

Mujtaba Chaudry
Art Unit 2133
April 14, 2005

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